

## **REMARKS**

Applicants have now had an opportunity to carefully consider the Examiner's comments set forth in the Office Action of May 6, 2008. Claims 1-3, 5-18 and 20-21 are pending in the application. Claims 1, 10, 18 and 21 have been amended. Claims 4 and 19 have been cancelled.

Reconsideration of the Application is requested in view of the comments and amendments therein.

### **I. The Office Action**

Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 is rejected under 35 U.S.C. 102(b) as being anticipated by Gilbert (U.S. Patent 3586304).

Claims 1-7, 9-10, 14-15 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vild (U.S. 6217823) in view of Mordue (U.S. 6451247).

Claims 8, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vild (U.S. 6217823) and Mordue (U.S. 6451247) and further in view of Nissim (U.S. 2386565).

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vild and Mordue and further in view of Hall (U.S. 1773729).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vild and Mordue and further in view of Gilbert (U.S. 6036745).

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vild and Mordue and further in view of Gilbert (U.S. 5310412).

Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vild in view of Hall (U.S.1773729).

Claims 1, 4-6, 10 and 13 are provisionally rejected on the grounds of nonstatutory obviousness type double patenting as being unpatentable over claims 1-7 and 19 of co-pending Application No. 10/723504 in view of Mordue.

## **II. Rejection of Claims 18-20 Under 35 U.S.C. 112, Second Paragraph**

Claims 18-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Particularly, the Examiner asserts that claims 18-20 are drawn to a method for extending the life of a material submergence device; however, include no active process steps involved in said method, rendering the scope of the claims indefinite. Applicant respectfully disagrees. The Examiner states that the cited "confining" step is not an active step because it would inherently occur given the structure of the apparatus presented in claims 1-17 and 21. Applicant asserts that the Examiner's reasoning is improper. Claim 18 is an independent claim not based on the structure defined in any other claim. Therefore, confining the submergence device with a structure made from a material that has a greater tensile strength is an active step, since it is not dependent on a claim that would make such a feature inherent.

Although Applicant continues to traverse the Examiner's rejection, claim 18 has been amended to further clarify that the active step requires "providing a biasing member at the top of said rod, attaching a nut above said biasing member; producing a compressive force on said body by tightening said nut; and confining the material submergence device with a structure made from a material that has a greater tensile strength than the refractory material."

For at least the aforementioned reasons, claim 18 (along with claims 19-20 that depend therefrom) is in condition for allowance. Therefore, the rejection should be withdrawn.

## **III. Rejection of Claim 21 Under 35 U.S.C. 102(b)**

Claim 21 stands rejected under 35 U.S.C. 102(b) as being anticipated by Gilbert (U.S. 3586304). Applicant respectfully asserts that the listed inventor for U.S. 3,586,304 appears to be Greaves, not Gilbert as the Examiner sets forth. Applicant bases the foregoing response on U.S. 3,586,304. The rejection should be withdrawn for at least the following reasons. Greaves does not teach or suggest the invention as set forth in the subject claims.

While Applicants traverse the positions laid out in the Office Action, and in particular paragraph 4, in order to move the application forward, Applicants have amended claim 21. As amended, claim 21 recites a furnace comprising a submergence device well, a pump well in

communication with the submergence well, a dross well in communication with the submergence device well, and a removable submergence device disposed in the submergence device well that includes a body comprised of a refractory material that defines a submergence chamber, the body including at least one passage and a rod in the passage, wherein the rod is placed under tension to impart a compressive load on the body. Greaves does not teach or suggest the subject embodiment.

In particular, Greaves fails to teach or suggest a removable submergence device disposed in the submergence device well that includes a body comprised of refractory material with at least one passage and rod under tension. The Examiner points to reference numeral 56 to support the assertion that Greaves discloses a removable submergence device; however, reference numeral 56 refers to adjustable struts that extend between the top of the furnace shell and the auxiliary frame structure. The struts are used for supporting the furnace and restraining it from twisting and lateral movement. The struts do not comprise a submergence device, but are instead part of the support frame. It follows that since Greaves fails to disclose a submergence device, Greaves necessarily does not include the body or passage and rod that comprise the device as recited in claim 21.

Moreover, the Examiner points to reference numeral 20 to support the assertion that Greaves teaches a dross well; however, Greaves does not use 20 as a reference numeral. Therefore, Applicant is unclear as where the support for such an assertion is based.

In light of the foregoing, it is respectfully submitted the Greaves fails to teach or suggest the subject invention as recited in independent claim 21. Accordingly, the rejections should be withdrawn.

#### **IV. Rejection of Claims 1-7, 9-10, 14-15 and 18-19 Under 35 U.S.C. 103(a)**

Claims 1-7, 9-10, 14-15 and 18-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vild (U.S. 6217823) in view of Mordue (U.S. 6451247). Applicant respectfully traverses the rejection for at least the following reason. Vild in view of Mordue does not, individually or in combination, teach or make obvious the subject invention as embodied in the subject claims.

Independent claim 1 and similarly independent claims 10 and 18, as amended, discloses a scrap submergence device comprising a body defining a submergence chamber comprised of a

refractory material, wherein said body comprises a side wall and a base, the side wall including an at least substantially vertically oriented passage, and the base including an at least substantially vertically oriented passage aligned with the passage in the side wall, at least one inlet passage and at least one discharge passage; and a rod in the at least one passage. The rod is inserted into the at least one side wall passage and received by the at least one base passage. Further, the rod is placed under tension to impart a compressive load on the body.

According to the Examiner, Vild teaches a metal scrap submergence device comprising a body comprised of a refractory material, wherein the body includes a sloped inlet passage for allowing material to enter the submergence chamber. The Examiner further correctly states that the inlet passage is disposed in a side wall. In contrast, Claim 1 requires an inlet passage disposed in the base. Such a difference in inlet passage location affects the vortex thereby formed.

In addition, the Examiner acknowledges that Vild fails to disclose the use of rods inserted into the chamber body in order to put the body under compression. The Examiner argues that Mordue teaches that it was known in the art at the time the invention was made to employ rods to place refractory bodies under compression in molten metal applications and also to use rods to join objects together. Applicant respectfully traverses.

Mordue teaches of a molten metal pump comprising wherein at least one post suspends a housing from a support. Mordue does not form the pumping chamber housing with a rod. Rather, the pumping chamber 1005 is completely formed in a single graphite block. The posts disclosed in Mordue suspend the housing from the support (col. 3, lines 8-10), but do not form a fluid containing chamber. Furthermore, Mordue fails to describe producing a compressive force on the housing itself. Mordue refers to placing a compressive force on the outer member or sheath, not the housing.

For at least the reasons set forth above, it is respectfully submitted that Vild in view of Mordue does not render the present invention unpatentable. Therefore, Applicant respectfully requests the rejection of claims 1, 10 and 18 (along with claims 2-7, 9, 14-15, and 19 that depend therefrom).

**V. Rejection of Claims 8, 17 and 20 Under 35 U.S.C. 103(a)**

Claims 8, 17 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vild in view of Mordue and further in view of Nissim (U.S. 2386565). According to the Examiner, Vild in view of Nissim does not disclose the use of a frame to limit thermal expansion or contraction; however, Nissim teaches that it was well known in the art to use a steel frame to take up mechanical stresses caused by thermal expansion of the material supporting said frame. The Examiner further asserts that it would have been obvious to one of ordinary skill to include the frame of Nissim in the submergence device taught by Vild and the rods of Mordue, in order to ease the mechanical stresses caused by the thermal expansion and contradiction of the sidewalls. Applicant respectfully disagrees.

Nissim teaches of an open hearth furnace having at least one "charging section" of its roof formed separately from the hearth and from the remainder of the roof, and also a means for transferring the charging section so as to lie above another portion of the furnace roof. Although Nissim does teach a frame to withstand thermal expansion, Applicant asserts that there is no suggestion to combine the teachings of Vild, Mordue and Nissim, as advanced by the Examiner, except from using Applicant's invention as a template through a hindsight reconstruction of Applicant's claims. In light of the problem Nissim aims to solve, a person of ordinary skill in the art would not have looked to Nissim to solve the problem set forth in the present invention.

In addition, claims 8, 17 and 20 depend from and include all the limitations of claims 1, 10 and 18, respectively. As discussed above, claims 1, 10 and 18 are believed to be in allowable condition. Nissim does not make up for the aforementioned deficiencies of Vild and Mordue. Therefore, withdrawal of the rejection is requested.

#### **VI. Rejection of Claims 11 and 12 Under 35 U.S.C.(a)**

Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vild and Mordue and further in view of Hall (U.S. 1773729). Applicant respectfully traverses the rejection. Claims 11 and 12 depend from include all the limitations of independent claim 10. As discussed above, claim 10 is now believed to be in allowable condition. Hall does not make up for the aforementioned deficiencies of Vild in view of Mordue. Therefore, Applicant respectfully requests withdrawal of the rejection.

**VII. Rejection of Claim 13 Under 35 U.S.C. 103(a)**

Claim 13 stands rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vild and Mordue in view of Gilbert (U.S. 6036745). Applicant respectfully traverses the rejection. Claim 13 depends from and contains all the limitations of independent claim 10, which is believed to be in allowable condition as was discussed more fully above. Gilbert does not make up for the aforementioned deficiencies of Vild and Mordue. Therefore, withdrawal of the rejection is requested.

**VIII. Rejection of Claim 16 Under 35 U.S.C. 103(a)**

Claim 16 stands rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Vild and Mordue in view of Gilbert (U.S. 5310412). Applicant respectfully traverses the rejection. Claim 16 depends from and contains all the limitations of independent claim 10, which is believed to be in allowable condition as was discussed more fully above. Gilbert does not make up for the aforementioned deficiencies of Vild and Mordue. Therefore, withdrawal of the rejection is requested.

**IX. Rejection of Claim 21 Under 35 U.S.C 103(a)**

Claim 21 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Vild in view of Hall (U.S. 1773729). Applicant respectfully traverses the rejection for at least the following reason. Vild in view of Hall does not, individually or in combination, teach or suggest each element of the subject claims.

The Examiner asserts that Vild discloses a furnace comprising a submergence device well; a pump well in communication with the submergence device well and a dross well in communication with the submergence device well. However, as amended, claim 21 teaches a removable submergence device disposed in the submergence device well that includes a body comprised of a refractory material that defines a submergence chamber, the body including at least one passage and a rod in the passage, wherein the rod is placed under tension to impart a compressive load on the body. As the Examiner stated in paragraph 6 of the Office Action in reference to claim 1, Vild does not disclose the use of rods inserted into the chamber body in order to put the body under compression. Applicant further refers the Examiner to the discussion of this limitation in Section IV above.

In addition, the Examiner reasons that although Vild does not teach the removal feature of the submergence device, the interlocking feature of notches and protrusions taught by Hall would allow for the removal feature of the submergence device. Applicant asserts that Hall fails to make up for the aforementioned deficiencies of Vild. Therefore, Applicant respectfully requests the withdrawal of the rejection.

**X. Double-Patenting Provisional Rejection**

The Examiner rejects claims 1, 4-6, 10 and 13 as being unpatentable over various claims of co-pending Application No. 10/723,504 in view of Mordue (U.S. 6451247). Applicants submit herewith a terminal disclaimer.

### CONCLUSION


For the reasons detailed above, it is respectfully submitted all claims remaining in the application (Claims 1-3, 5-18 and 20-21) are now in condition for allowance.

Respectfully submitted,

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